(two cardiospasm, four idiopathic dilatation of the œsophagus), which by means of forced stretching of the cardia were either entirely cured or so much improved that they may be considered almost cured. For even if a small residue is found in the œsophagus in some of these patients, still they do not experience any discomfort at meals and can partake of them in the same manner as normal persons. Case V (C. V. B.) deserves special mention, because the *x*-ray photographs before and after treatment by means of stretching show plainly the variation in size of the œsophagus, which is only one-third as large as before treatment. The success of treatment by means of stretching is very marked, and may now be regarded as the accepted mode of treatment in this disorder. These favorable results obtained by means of forced stretching of the cardia in cases of cardiospasm and diffuse dilatation of œsophagus have induced me to try a similar method of treatment in pylorospasm. I have, indeed, had apparently good results in some cases from stretching the pylorus.

A PRELIMINARY NOTE ON MEDICAL USES OF RECTAL INFUSIONS.

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The use of the lower bowel as a channel for the introduction of fluids into the body dates back to early days in medicine, but since rational application of the method was devised by J. B. Murphy,[1] it has become one of the salient procedures in postoperative surgical therapeutics. It is not surprising that the practice of proctoclysis, which has become well nigh routine in the surgical clinic, should promise to assume a definite place in the wider field of medical treatment. But the procedure must degenerate into mechanical manipulation unless the indications for its service and the limitations of its usefulness are established by critical observation. An intelligent application of the method presupposes a definite notion of its mode of action and of the objects to be accomplished. From a theoretical point of view the following summary may be made of the distinctive vital relations of proctoclysis: (1) Rectal infusions would seem less disturbing to the economy than fluid offered to the body through any other channel. Fluid introduced into the lower bowel by the "Murphy method" produces a minimum of peristaltic reaction, and its absorption is probably regulated by the vital demands of the organism. (2) Warm rectal infusions have a diuretic

[1] Perforative Peritonitis, Surgery, Gynecology, and Obstetrics, June, 1908.

effect, which is frequently immediate and intense. In certain cases the amount of fluid expelled from the body by diuresis greatly exceeds that introduced by proctocylsis. (3) Soluble toxins proceeding from foci of infection impair the vitality and reduce the resistance power of the healthy tissues through which they circulate. The surgeon has a lively sense of the gravity of this incident as influencing tissue repair and general reaction after operation. The condition is no less important in medical cases of disease. Dilution of the circulating toxins with imbibed fluid and their removal by diuresis would seem not only to protect the kidneys by lessening the concentration of the poisons excreted, but tend to safeguard the sound tissues from intoxication. (4) Clinical observation indicates that microbic metastasis is prone to seek out regions where tissues have already been injured by circulating toxins. Thus, in gonorrhœal infection there is reason to believe that joint pains due to transported toxins are apt to precede the local establishment of the cocci. Proctoclysis appears to ameliorate such pains and, inferentially, limit extension of the infection. (5) The addition of foreign fluid to the circulation is an important aid to the maintenance of a normal arterial blood pressure, possibly not so much by reason of the volume of fluid added as by reducing intoxication by the mechanism of circulation. (6) The exhibition of many medicines by way of rectal infusions commends itself as free from obvious disadvantages inherent to the oral channel.

For many years I have occasionally applied one or another method of proctoclysis in the medical clinic, but only during the last year has the method been somewhat systematically pursued according to the principles of Murphy's technique. In my observations the attempt has purposely been made to achieve results with the aid of such simple apparatus as is available in any bedroom. It is probable that the results would have been more satisfactory with a more adequate equipment. The fluid infused was tap water or normal saline solution, as the condition of the patient seemed to demand. One or two pints of fluid, rather hot to the touch, would be placed in the bag of a "fountain syringe" and introduced into the rectum through the hard rubber tip commonly used for enemas. The bag was usually suspended so that the surface of fluid within it should be elevated six to eight inches above the anus. The bag is raised or lowered according to the rate of outflow or complaints of the patient. Nearly two pints of fluid should flow out in the course of an hour. With this simple apparatus considerable difficulty is experienced from the cooling of the fluid in the outflow tube. This is partly remedied by keeping the tube under the bedclothes, or occasionally withdrawing the tip and allowing the cooled fluid to run off. The temperature in the reservoir may be maintained by the addition now and then of small quantities of very hot water or saline solution. As is well known, the essence of Murphy's method lies in

the free communication between the rectum and reservoir with the hydrostatic balance so slightly in favor of the latter that, while fluid surely gravitates toward the bowel, a slight excess of pressure within the rectum is relieved by a reversal of the current into the reservoir. The head of pressure in the reservoir should be so low that the distention occasioned by the flow should neither provoke contraction of the gut nor cause perceptible reaction of the anal sphincter. The special form of outflow tip, having a sharp bend in its course, which Murphy devised for patients treated in the Fowler's position does not seem necessary for medical patients that lie supine.

In my experience proctoclysis pursued in this manner is not always so indifferent to the comfort of patients as surgeons seem to find. Both the mechanical relations of the Fowler's position and the psychic distraction of a surgical injury probably combine to facilitate the application of the method in operative cases. With medical subjects it is often difficult to adjust the apparatus so as to avoid discomfort. The nurse is prone to raise the reservoir of fluid too high.

In practice it has been my habit to judge the utility of the method largely by the reaction of the kidneys. Abundant diuresis has been accepted as a sign of the efficiency of the procedure or vice versa. Instead of continuous proctoclysis, as commonly employed by the surgeon, I have usually sought the absorption of a quart of fluid twice daily, in forenoon and afternoon.

The cases on which this article is based may be divided into two groups: (1) Those in which it is desired to raise arterial blood pressure or, by stimulating diuresis, to deplete an effusion. (2) Those in which it is endeavored to reduce toxemia.

In the first group two cases gave such striking results as to form a basis for further observation. One was that of a man of middle age, probably an old alcoholic, prostrated with an asthenia of uncertain origin. Proctoclysis to the extent of two quarts of saline solution daily seemed an important aid to his gradual recovery. The other was that of a man of about sixty years, with pleural effusion, general dropsy, and orthopnœa of myocardial origin. Hot water given by the "drop method" resulted in a progressive diuresis, which in a few days removed the dropsy and led to recovery of cardiac compensation. Other attempts to reduce dropsical effusions by proctoclysis have not been so successful, but the conclusion from a considerable experience favors the exhibition of hot water by the bowel in an effort to reduce dropsical accumulations which do not yield to other remedies. Of course, a comparison of the volume of fluid absorbed with that excreted quickly determines the availability of the method.

But it is the second class of cases, those suffering from constitutional toxemia, which offer the most pertinent field for proctoclysis. Already the method has been advocated, more or less modified, in the

treatment of typhoid fever and of scarlet fever. Durbin[2] has long used colonic saline irrigations with favorable results in the treatment of typhoid fever, and Riesman[3] has recently reported satisfactory results obtained by the Murphy method. My own experience with proctoclysis in this disease has also been favorable, but is based on only a half-dozen cases. In a similar number of cases of lobar pneumonia, one of which was in an alcoholic with extensive lung involvement, high temperature, and wild delirium, I have been much impressed with the favorable effects when proctoclysis with hot tap water was made a therapeutic measure. The procedure was usually followed in a few hours by an abatement of the signs of toxemia, and especially by improvement in the mental condition.

Indeed, no class of cases has been more obviously ameliorated than that suffering from delirium. I have been struck with the rapid clearing up of the mental condition in obstinate cases of delirium tremens encountered in my wards of the Denver County Hospital. The resident interne assisting me, Dr. Elizabeth M. Collier, has continued the application of the method in such subjects since the lapse of my term of service, and reports very favorable results from it.

I have used saline infusions in four cases of scarlet fever, two of them very severe, and the results were admirable. The casts and albumin found in the urine early in the disease disappeared before the patients were ready to leave their beds.

In functional disorders marked by acetonuria, great gastric irritability. and depression of renal activity, proctoclysis and the administration of bicarbonate and salicylate of soda by rectal infusion have proved of great value.

In a number of cases of chronic pulmonary tuberculosis having a daily rise of temperature, I have failed to see decided benefit from proctoclysis. But in intercurrent febrile, "grippal" attacks the comfort of the patient has been greatly increased and the invasion apparently cut short by the procedure. In the sudden flooding of the system with toxins from confined pus, which not rarely occurs in tuberculous subjects, remarkable amelioration of the symptoms may follow a saline infusion by the bowel.

In conclusion, it must be admitted that the favorable results accompanying the use of proctoclysis in appropriate medical cases indicate that this method of *quasi* internal hydrotherapy deserves such a thoroughly detailed study as will accurately establish its indications and limitations in medical therapeutics.

[2] Denver Medical Times and Utah Medical Journal, July, 1909.
[3] Jour. Amer. Med. Assoc., January 29, 1910.